

I claim:

1. An backlight for providing lighting to an object that is to undergo magnification by a microscope, the backlight comprising:
 - a housing,
 - control circuitry located within said housing for controlling operation of the backlight,
 - at least one switch in electrical communication with said control circuitry for a user to initiate and terminate light transmission from the backlight,
 - at least one flexible conduit having a proximal end and a distal end, said flexible conduit proximal end extending from said housing,
 - said flexible conduit being bendable and positionable in order to direct light in a particular direction,
 - said flexible conduit having wire for the purpose of providing electrical power to a semiconductor light source located at said flexible conduit distal end,
 - a head located at said flexible conduit distal end,
 - a semiconductor light source module at said head,
 - said semiconductor light source module including
 - a primary heat sink,
 - a light emitting semiconductor chip affixed to said primary heat sink,
 - and
 - a secondary heat sink, said primary heat sink being affixed to said secondary heat sink, and

a heat conductance path beginning with said semiconductor chip which emits both light and heat when it is powered, said heat flowing to said primary heat sink and thence to said secondary heat sink.

2. A device as recited in claim 1 further comprising:

a reflector at said head for gathering and reflecting light emitted by said semiconductor chip into a useful light beam.

3. A device as recited in claim 1 further comprising:

a lens at said head for gathering and focusing light emitted by said semiconductor chip into a useful light beam.

4. A device as recited in claim 1 further comprising a dome over said

semiconductor chip.

5. A device as recited in claim 1 further comprising a coating on said

semiconductor chip for converting light emitted by said chip to white light.

6. A device as recited in claim 3 wherein the backlight provides a light

beam with a light profile that peaks in relative intensity at about a 0 degree view angle.

7. A device as recited in claim 4 wherein the backlight provides a light beam with a light profile that peaks in relative intensity at about a 0 degree view angle.

8. An backlight for providing lighting to an object that is to undergo magnification by a microscope, the backlight comprising:

- a housing,
- at least one flexible conduit having a proximal end and a distal end, said flexible conduit proximal end extending from said housing,
- said flexible conduit being positionable in order to direct light in a particular direction,
- a semiconductor light source module at said flexible conduit distal end,
- and
- a light beam modifying device that modifies light from said semiconductor light source to provide a light beam with a light profile that peaks in relative intensity at about a 0 degree view angle.

9. A device as recited in claim 8 wherein said semiconductor light source module includes

- a primary heat sink,
- a light emitting semiconductor chip affixed to said primary heat sink,
- and
- a secondary heat sink, said primary heat sink being affixed to said secondary heat sink, and

a heat conductance path beginning with said semiconductor chip which emits both light and heat when it is powered, said heat flowing to said primary heat sink and thence to said secondary heat sink.

10. A device as recited in claim 9 wherein said semiconductor light source includes:

a well,
said chip being mounted in said well,
and said coating at least partially filling said well.

11. A device as recited in claim 9 wherein said semiconductor light source includes:

a primary well,
a plurality of sub-wells located in said primary wells,
a plurality of light emitting semiconductor chips located in said sub-wells.

12. A device as recited in claim 11 wherein said coating fills said sub-wells and wherein said coating at least partially fills said primary well.

13. A device as recited in claim 9 further comprising a quantity of heat-conductive adhesive that secures said primary heat sink to said secondary heat sink.

14. A device as recited in claim 10 further comprising a quantity of light-reflective adhesive that secures said chip to said primary heat sink.

15. A device as recited in claim 10 further comprising a dome over said primary heat sink, said dome serving to focus light emitted by said chip and direct it in an arc of a circle defined by Θ .

16. A device as recited in claim 9 wherein said primary heat sink has a smaller interior volume than said secondary heat sink.

17. A device as recited in claim 8 further comprising:
a reflector at said head for gathering and reflecting light emitted by said semiconductor chip into a useful light beam.

18. A device as recited in claim 8 further comprising:
a lens at said head for gathering and focusing light emitted by said semiconductor chip into a useful light beam.

19. A device as recited in claim 9 further comprising a dome over said semiconductor chip.

20. An backlight for providing lighting to an object that is to undergo magnification by a microscope, the backlight comprising:

a housing,

at least one flexible conduit having a proximal end and a distal end, said flexible conduit proximal end extending from said housing,

said flexible conduit being positionable in order to direct light in a particular direction,

a semiconductor light source module at said flexible conduit distal end,

and

a light beam modifying device that modifies light from said semiconductor light source to provide a light beam with a light profile that peaks in relative intensity at about a 0 degree view angle, said light beam modifying device being selected from the group consisting of reflectors and lenses.